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NEW AND PREVIOUSLY UNRECORDED SPECIES OF REPTILES AND AMPHIBIANS FROM THE ISLAND OF FORMOSA

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The herpetological fauna of the island of Formosa has been represented in museums by but few specimens, and our knowledge of it has been correspondingly fragmentary. It has been, therefore, a source of much pleasure recently to receive from this island a collection of some two thousand specimens, beautifully prepared and carefully labeled as to localities. This collection is of extreme interest since, in addition to the species previously recorded from Formosa, it includes many species not hitherto known to occur in this island. Some of these are already known from examples secured either in the Riu Kiu Islands, to the north, or from continental Asia. Others, including a representative of a new genus, are new to science.

This paper is intended merely as a preliminary record of the new and unrecorded species. A more complete report upon the collection must await further study.

Ophisaurus harti Boulenger?

The presence in Formosa of a species of *Ophisaurus* is attested by a specimen now in the Taiwan Medical School. This specimen was collected, by the late Rev. Mr. MacKay, at Tamsue. Another specimen, collected at Shinchiku, was formerly in this museum, but has been lost. We have not as yet secured a specimen, but our collector states that individuals have been seen at Takao sunning themselves on a stone wall that borders a grove of screw pines.

The general relationship of the fauna would lead one to suspect that the *Ophisaurus* of Formosa is probably identical with Boulenger's *O. harti* from Fokien, China; but the notes which I have received concerning the specimen in the Medical School indicate that the Formosan lizard is distinct. The matter must remain undecided until a specimen is received for examination.

Takydromus septentrionalis Günther

The collection includes a number of specimens of this lizard from the Pescadores, as well as a large series from Taihoku, Koshun, Polisia, Taipeh, and Keelung, Formosa.

Takydromus sauteri new species

Diagnosis.—Dorsals large, in regular series; four pairs of postmental shields; one inguinal pore on each side; head and tail much elongate; color above bright green; upper lip and lower surfaces white.

Type.—California Academy of Sciences, No. 18001. Koshun, Formosa.

Takydromus kuehnei new species

Diagnosis.—Dorsals large, in regular series; four pairs of postmental shields; four or five inguinal pores on each side; head elongate; olive or olive brown above, with dark olive brown lateral streak, lower surfaces white.

Type.—California Academy of Sciences, No. 18002. Kanshirei, Formosa.

Polyodontophis collaris Gray

This snake, which previously has not been reported from Formosa, is represented in the collection by two specimens from Kanshirei. Boulenger has recorded the species from Fokien, China.

Pseudagkistrodon new genus

Maxillary teeth thirteen, moderate, subequal, followed, without an interspace, by two extremely large fangs. Dentary not movable on articular. Mandibular teeth subequal. Head elongate, moderately distinct from neck. Eye large, with round pupil, completely separated from labials by a series of suboculars. Body stout; scales strongly keeled, in 23-24 rows, without apical pits. Gastrosteges rounded. Anal divided. Urosteges in two rows. Tail moderate. Hypapophyses present throughout vertebral column.

This remarkable new genus appears to be most closely allied to *Macropisthodon.* The maxillary bone is very short. The two long teeth lie horizontally and directed inward and backward, in such position that it is difficult to see how they can be used. Their posterior edges are sharp. The posterior portion of the palatine is much thickened. The quadrate is of extreme length. Externally the genus may be distinguished by the complete series of oculars surrounding the eye.

The type and only known species of the genus is:

Pseudagkistrodon carinatus new species

Type.—California Academy of Sciences, No. 18003. Formosa.

Description of the Type.—General form rather short, moderately stout, head elongate, tail moderate. Rostral twice as broad as deep; internasals a little broader than long, nearly as long as prefrontals; frontal longer than broad, nearly as long as parietals, longer than its distance from end of snout; supraocular in contact with prefrontal; all upper head plates roughened; loreal very small; eye bordered in front, below and behind by a series of nine small plates; temporals 3-4, strongly keeled; supralabials seven, fifth or sixth largest; infralabials nine, first in contact with its fellow; anterior genials smaller than posterior, in contact with first four infralabials; posterior genials separated from first gastrostege by one plate; scales very strongly keeled, in twenty-three rows, those of outer row nearly twice as large as those above; gastrosteges 141; anal divided; urosteges in two series, 64 and tip.

Head uniform brown above, yellowish white below; rostral, suboculars and supralabials yellowish white, the latter clouded with brown; a dark streak from rostral through nostril and eye to upper part of last labial. Body grayish or yellowish brown above; anteriorly with large, irregular, dark brown, sometimes black-edged, blotches separated by angular pale areas. Sides with smaller alternating dark blotches. Posteriorly the blotches become much smaller and are disposed in transverse series of three. Lower surfaces yellowish white, dotted, clouded or marbled with dark brown.

Length to anus	543 mm.
Length of tail	173 mm.

A second specimen from Toroku, Formosa, caught in 1905, is in the Sanitary Laboratorium, Formosa. A third specimen, received by the Academy, was collected at Mt. Arisan, Central Formosa. In coloration and form this serpent is, at first glance, strongly suggestive of *Agkistrodon acutus*, although on direct comparison they appear very dissimilar.

Natrix copei new species

Diagnosis.—Maxillary teeth about 21, gradually increasing in size posteriorly, not followed by abruptly enlarged ones. Head distinct from neck. Eye rather large with round pupil; lateral. Internasal shields broadly truncate anteriorly. Anal divided. Scales in seventeen rows. Temporals 1-1 or 2-2. Seven supralabials; third and fourth entering the eye. Gastrosteges 125-128. Urosteges 76.

Type.—California Academy of Sciences, No. 18004. Kanshirei, Formosa, April, 1909.

Description of the Type.—Eye rather large; rostral once and a half as broad as deep, scarcely visible from above; internasals shorter than prefrontals; frontal much longer than broad, longer than its distance from end of snout, shorter than parietals; loreal about as deep as long; one preocular; three postoculars; temporals 1-1; seven upper labials, third and fourth entering eye; four lower labials in contact with anterior genials; posterior genials much longer than anterior; scales in 17 rows, strongly keeled except first row where smooth or weakly keeled; gastrosteges 123; urosteges divided; anal divided.

Head nearly uniform brown; labials light with blackish edges. Upper surfaces of body and tail rather dark brown with a suggestion of a paler brown stripe on each side along the fourth, fifth and sixth scale-rows, and indications of small blackish spots medially and laterally. Outer row of scales lighter, clouded with slate. Belly yellow, with a more or less wedged-shaped blackish spot near the outer extremity of each gastrostege and urostege forming a distinct series along each side of the belly and tail.

Length to anus	320 mm.
Length of tail	54 mm. (broken)

This is a most clearly defined species, since the very small number of gastrosteges occurs in no other Asiatic member of the group with seventeen scale-rows. I have examined specimens from Kosempo and Kanshirei, Formosa. It gives me much pleasure to name this species in memory of Professor Cope, whose studies have thrown so much light upon the relationship of the species of natricine snakes.

Elaphe porphyracea (Cantor)

Mr. Boulenger has recorded four specimens from Fokien, China. It is of much interest to find that the species occurs also in Formosa, where it has been taken at Kanshirei, Shinchiku and Giran.

Oligodon ornatus new species

Diagnosis.—Scales in 15 rows, anal divided; nasal undivided; postoculars two, supralabials seven, the sixth excluded from the labial margin; gastrosteges 161.

Type.—California Academy of Sciences, No. 18005. Shinchiku, Formosa.

Description of the Type.—Nasal undivided; portion of rostral visible from above much shorter than its distance from frontal; suture between internasals shorter than that between prefrontals; frontal a little shorter than its distance from end of snout, much shorter than parietals; loreal united with prefrontal; one preocular; two postoculars; temporals 1-2; seven supralabials, the third and fourth entering the eye, the sixth excluded from the labial margin; four infralabials, in contact with anterior genials; posterior genials but little smaller than anterior; scales in fifteen rows; gastrosteges 161, angulate laterally; anal divided; urosteges 37, in two series.

Light brown above, with nine transverse, dark brown blotches on the body and two on the tail. These blotches are edged with whitish yellow and are serrate in outline. Midway between these large blotches are transverse series of small brown spots. Head yellowish brown with dark brown markings consisting of a blotch on rostral and nasals, a cross band from prefrontal region through eyes to third, fourth and fifth labials, and a V-shaped band from posterior part of frontal across parietals and second series of temporals to angle of mouth. A large blotch, bifid posteriorly, on nape and posterior portions of parietals. Lower surfaces yellowish white, with quadrate black spots on many of the gastrosteges and irregular spots on the anterior urosteges.

Length to anus	292 mm.
Length of tail	51 mm.

The type specimen is the only one we have obtained, but in the Taiwan Museum is one said to have been collected at Horisha, Formosa.

This species combines several of the characters of *O. templetoni* and *subgriseus* but seems to be distinct from both. It resembles *O. waandersii* and *melanocephalus* in the possession of an undivided nasal plate.

Callophis macclellandii (Reinhardt) ?

In the Taiwan Library is a peculiar specimen of a *Callophis* which differs so much from the usual *C. macclellandii* that our collector, failing to secure a specimen like it, has sent us a photograph and some careful notes concerning it. The specimen in question was collected at Giran, Formosa.

The left maxilla has been destroyed. No small teeth could be made out on the right maxilla. There are one pre- and two postoculars; seven supralabials, the third and fourth entering the eye; frontal nearly as long as the parietal; temporals 1-1; genials nearly equal, anterior in contact with anterior four infralabials; scales in thirteen rows; gastrosteges 243; urosteges 29; anal divided; tail ending in a spine-like scale.

The head is black with a white band across adjoining halves of the sixth and seventh labials, the temporals, anterior half of parietals and posterior third of frontal. There is a black dorsal stripe covering the median scale-row and half of the adjoining row on each side. External to this is a brown stripe covering two and one-half rows, while the outer three rows are occupied by a black lateral stripe. This outer black stripe is interrupted by twenty-one white spots, each followed by a black blotch which encroaches on the fourth scale-row and on a gastrostege. These white spots are farther apart and smaller posteriorly. Gastrosteges with black spots and cross bars for about one-third of surface.

There is some doubt as to whether this specimen represents an undescribed species or merely an individual variation from the usual coloration of *C. macclellandii* but it seems best to regard it as the latter, at least until a specimen is received.

We have received *C. maccellandii* from Kosempo and Suishako, Formosa.

Amblycephalus formosensis new species

Diagnosis.—Loreal and preocular distinct; a long subocular separating eye from labials; prefrontal entering eye; scales smooth; eye bordered by four shields; gastrosteges 171; urosteges 80.

Type.—California Academy of Sciences, No. 18006. Kanshirei, Formosa, March 27, 1909.

Description of the Type.—Rostral as deep as broad; internasals about half the length of prefrontals; frontal little longer than broad, longer than its distance from end of snout, much shorter than parietals; a small interparietal; loreal deeper than long; eye surrounded by supraocular, prefrontal, one preocular, long crescentic subocular, and one postocular; temporals 2-3; supralabials seven, last two elongate, none entering eye; first lower labial not meeting its fellow; three pairs of large chin shields, first longer than broad. Scales smooth, in fifteen rows, vertebral row enlarged. Gastrosteges 171. Anal entire. Urosteges 80, plus tip.

Snout yellow; tip of head grayish brown dotted with black; an irregular black streak from supraocular to side of neck; side of head yellow, a row of small blackish spots from first lower temporal across last two supralabials to near tip of second gastrostege. Upper surfaces brownish yellow with dark brown or blackish transverse bars or blotches, usually interrupted along the spine, 47 to 50 on body and neck, and about 14 on tail. Below, yellowish white, sparingly dotted with black.

Length to anus	208 mm.
Length of tail	66 mm.

Agkistrodon acutus Günther

This interesting addition to the known fauna of Formosa is represented in the collection by three specimens from Koshun. In the Taiwan Medical School is a specimen from Shinchiku. Mr. Boulenger has recorded this species from Fokien, China.

Rana namiyei Stejneger

The collection contains numerous specimens which agree with Stejneger's description of the type from Okinawashima, Riu Kiu. These are from Kanshirei and Polisia, Formosa.

Rana latouchii Boulenger

A very large series of frogs from Kanshirei, Formosa, evidently represent this species, which Boulenger described from Fokien specimens.

Rana taipehensis new species

Diagnosis.—Allied to *Rana erythræa.* Vomerine teeth in two oblique groups between and extending behind choanæ; interorbital space broader than upper eyelid; tympanum very distinct, two-thirds diameter of eye. Fingers moderately slender, with expanded tips, first not longer than second. Toes slender, moderately webbed, three phalanges of fourth toe free; two small metatarsal tubercles; tibio-tarsal joint reaches nostril; thighs overlap. Distinct, rather broad, dorsolateral fold; a narrower lateral fold. Skin smooth. Bluish gray above; upper lip, dorsolateral and lateral folds white; loreal and tympanic regions, area between dorsolateral and lateral folds and stripe above dorsolateral fold blackish. Limbs with longitudinal dark stripes. Lower surfaces yellowish white.

Type.—California Academy of Sciences, No. 18007. Taipeh, Formosa.

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